Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A computed tomography method comprising the steps of:

a) generating, using a radiation source and a diaphragm arrangement which is arranged between an examination zone and the radiation source, a fan beam which traverses the examination zone and an object present therein,

b) generating relative motions, comprising a rotation of the radiation source about an axis of rotation and the object,

c) acquiring measuring values which are dependent on the intensity of the radiation by means of a detector unit which detects, during the relative motions, the primary radiation from the fan beam and radiation which is coherently scattered in the examination zone or on the object, and

d) reconstructing a CT image of the examination zone from the measuring values, the reconstructing including:

multiplying the measuring values by a first weighting factor, which corresponds to a square of a distance between a scatter center, at which the detected ray is scattered, and a point of incidence of the scattered ray on the detector unit;

multiplying the weighted measuring values by a second weighting factor, which corresponds to a reciprocal value of a cosine of the scatter angle; and

backprojecting, after the steps of multiplying the measuring values by the first and second weighting factors, ~~during which a back projection is carried out~~ in a volume which is defined by two linearly independent vectors of a rotational plane and a wave vector transfer.

2. (Previously presented) The computed tomography method as claimed in claim 1, in which the back projection during the reconstructing step d) is performed along rays having a curved shape.

3. (Cancelled)

4. (Currently amended) The computed tomography method as claimed in claim [[3]] 1, in which prior to the back projection in the reconstructing step d) all measuring values for each radiation source position are multiplied by a weighting factor which corresponds to the reciprocal value of the square of the distance between the radiation source position and the scatter center at which the detected ray was scattered.

5. (Previously presented) The computed tomography method as claimed in claim 1, in which the reconstructing step d) comprises the following steps:

one-dimensional filtering of the measuring values in the direction parallel to the rotational plane,

rebinning of the measuring values so as to form a number of groups, each measuring value measured by a detector element being associated with an imaginary line from the detector element to a radiation source position and each group comprising a plurality of planes which are parallel to one another and to the axis of rotation and in which a respective line fan is situated,

reconstruction of the distribution of the scatter intensity from the measuring values, a back projection then being carried out in a volume which is defined by two linearly independent vectors of the rotational plane and a wave vector transfer.

6. (Previously presented) A computer tomography, comprising

a radiation source;

a diaphragm arrangement which is arranged between an examination zone and the radiation source, in order to generate a fan beam which traverses the examination zone,

a detector unit which is coupled to the radiation source and comprises a measuring surface,

a drive arrangement for displacing an object present in the examination zone with respect to the radiation source along an axis of rotation and/or parallel to the axis of rotation,

a reconstruction unit for reconstructing the distribution of the scatter intensity within the examination zone from measuring values acquired by the detector unit, and

a control unit for controlling the radiation source, the detector unit, the drive arrangement and the reconstruction unit in conformity with the steps a) to d) of claim 1.

7. (Currently Amended) A computer readable medium containing instructions for controlling a control unit for controlling a radiation source, a diaphragm arrangement, a detector unit, a drive arrangement and a reconstruction unit of a computer tomograph so as to carry out a method comprising:

a) generating, using the radiation source and the diaphragm arrangement which is arranged between an examination zone and the radiation source, a fan beam which traverses the examination zone,

b) rotating the radiation source about the examination zone,

c) acquiring measuring values which are dependent on the intensity of the radiation by means of the detector unit which detects, during the rotation of the source, the primary radiation from the fan beam and radiation which is coherently scattered in the examination zone or on the object, and

d) reconstructing a CT image of the examination zone from the measuring values, during which reconstruction a back projection is carried out in a volume which is defined by two linearly independent vectors of the rotational plane and a wave vector transfer<u>, wherein prior to the back projection, the measuring values are multiplied by a first weighting factor that corresponds to a square of a distance between a scatter center, at which the detected ray is scattered, and a point of incidence of the scattered ray on the detector unit, and by a second weighting factor that corresponds to a reciprocal value of a cosine of a scatter angle</u>.

8. (Cancelled)

9. (Previously presented) The computed tomography method of claim 1, wherein the wave vector transfer is a function of a first distance between a detector element and a foot of the detector unit, a second distance between a scatter center and the foot of the detector unit, and an inverse wavelength of the coherently scattered radiation.

10. (Previously presented) The computed tomography method of claim 9, wherein the wave vector transfer is computed based on a function that does not include a scatter angle.

11. (Previously presented) The computed tomography method of claim 1, wherein the wave vector transfer is a function of $A/(2D\lambda)$, wherein A represents a distance between a detector element and a foot of the detector unit, D represents a distance between a scatter center and the foot of the detector unit, and λ represents the wavelength of the coherently scattered radiation.

12. (Currently amended) A computed tomography method, comprising:

generating, using a radiation source and a diaphragm arrangement arranged between an examination zone and the radiation source, a fan beam which traverses the examination zone;

generating a relative motion, comprising a rotation about an axis of rotation, of the radiation source about the examination zone and an object disposed therein;

acquiring measuring values which are dependent on the intensity of the radiation by means of a detector unit which detects, during the relative motion, the primary radiation from the fan beam and radiation which is coherently scattered in the examination zone; and

reconstructing a CT image of the examination zone from the measuring values, during which the measuring values are multiplied by a first weighting factor, which corresponds to a square of a distance between a scatter center, at which the detected ray is scattered, and a point of incidence of the scattered ray on the detector unit, and by a second weighting factor, which

corresponds to a reciprocal value of a cosine of a scatter angle, and then a back projection is carried out in a volume which is defined by two linearly independent vectors of a rotational plane and a wave vector transfer, wherein the back projection is performed in the volume along rays having a curved shape.

13. (Previously presented) The computed tomography method of claim 12, wherein the curved shape is a hyperbola.

14. (Previously presented) The computed tomography method of claim 13, wherein the hyperbola is a function of a distance between a scatter center and a foot of the detector unit.

15. (Cancelled)

16. (Currently amended) A computed tomography system, comprising:

a detector that detects primary and scattered radiation traversing an examination zone; and

a reconstructor that reconstructs measuring values indicative of the detected radiation, wherein the reconstructor back projects the measuring values in a volume as a function of a wave vector transfer that varies based on a difference between a scatter center and a foot of the detector, wherein prior to the back projection, the measuring values are multiplied by a first weighting factor, which corresponds to a square of a distance between a scatter center, at which the detected ray is scattered, and a point of incidence of the scattered ray on the detector unit, and by a second weighting factor, which corresponds to a reciprocal value of a cosine of a scatter angle.

17. (Previously presented) The computed tomography system of claim 16, wherein the wave vector transfer is a function of $(1/\lambda)\sin(\theta/2)$, wherein λ is the wavelength of the scattered radiation, and θ is a scatter angle.

18. (Previously presented) The computed tomography system of claim 17, wherein the scatter angle is a function of arctan(A/D), wherein A is a distance between a detector element of the detector and a foot of the detector and D is a distance between a scatter center and the foot of the detector.

19. (Previously presented) The computed tomography system of claim 16, wherein an intensity of the scattered radiation is dependent exclusively on a scatter material.

20. (Cancelled)